REMARKS

Claims 8, 9, 13 and 16 stand allowable if rewritten in independent form including all limitation of the base claim and any intervening claims. Claims 1-2, 10, and 14 stand rejected under 35 USC §102(b) as being anticipated by Berglund et al., U.S. patent 6,233,693. Claims 5-7, 11-13 and 18 stand rejected under 35 USC §103(a) as being unpatentable over Berglund et al., U.S. patent 6,233,693 in view of Deenadhayalan et al., U.S. patent 6,192,481.

Claims 1, 4, 8, 10, 13, 14, and 16 have been amended to more clearly state the invention. Indicated allowable claims 8, 13 and 16 have been rewritten in independent form including all limitation of the base claim and any intervening claims. Thus, claims 8, 9, 13, and 16 are believed to be in condition for allowance. Claims 7, 11, and 15 have been canceled. Reconsideration and allowance of each of the pending claims 1-6, 8-10, 12-14 and 16, as amended, is respectfully requested.

Berglund et al., U.S. patent 6,233,693 discloses a system start-up routine that is implemented to determine system device power requirements and system power capabilities, determine a maximal number of devices which can be started at one time, and start the maximal number of devices. The devices are, for example, direct access storage devices, i.e., disk drives. DASD spin-up power is approximated by a square pulse of power for a spin-up time, "sut," and the DASD spin-up power available, "dspa" is computed and divided by the power to spin-up one DASD, "dpsu," to determine the maximum number of DASD's which may be started at once. This can be implemented simply by an iterative loop that starts with the power available (dpsa) and repetitively

subtracts the power needed to spin-up one DASD (dpsu) until no more power is available. Steady-state operation requires a smaller power (dpr). For each DASD started, the bulk power available for steady-state operation (bpa) is computed by subtracting the steady-state operating power (dpr) for each DASD started from the bulk power available, also considering the power of each idle not started DASD (dpi). This value becomes the power available to start the next group of DASD's after "sut" expires for the first group. This process can be repeated until all DASD's are started. In block 23, the power available (bpa) is compared to the amount of power required to run the DASD's in the steady-state (nbp.times.dpr) plus the power differential to start (spin-up) the last DASD, that is, the difference between the spin-up power (dpu) and the steady-state running power (dpr). This calculation does two things. First, it confirms that enough power exists to operate the DASD's in the steady-state, notwithstanding the power required in starting them. Second, it confirms that sufficient power is available for the steady-state plus enough power to start the last DASD. This differential (dpsu-dpr) is required because, as already noted, it takes that much more power to start a DASD (dpsu) than to run it in the steady-state (dpr).

Deenadhayalan et al., U.S. patent 6,192,481 discloses a method and device for detecting and handling non-responsive devices in a computer system where the device non-responsiveness may be due to a powered-down status rather than a device failure, and more particularly to such computer systems when the devices are RAID disk drives. By scanning all devices connected in a configuration and maintaining a count of devices that time out without responding, a determination can be made as to

whether the devices are powered off or are experiencing some other problem that requires attention of a system support technician. By detecting a disk drive power-off condition, so that the disk drive fault management system (if provided) does not mark the drive off-line, but rather takes other action to recover from the disk-drive power-off condition. Specifically, in one embodiment of the invention, if all the disk drives connected on a single SCSI channel fail to respond, this serves as an indication that all of the drives on the channel are powered-off, and none of the disk drives are marked off-line. During normal disk I/O, if an error occurs, the RAID controller should perform the following steps. First, the controller scans the SCSI bus and determines those drives that are responding on the bus. Second, if at least one drive has responded during the bus scan, then proceed in conventional manner to place off-line (or "kill") those drives that are not responding. Since at least one disk drive on the commonly powered rack, unit, or storage shelf is operating and responsive, the entire unit cannot be powered off. Third, if only one drive was present prior to scanning then proceed in conventional manner to kill (mark as "off-line") that single drive that are not responding. In this instance, we may not know if the single disk drive is in some error state or is powered down, so we take a conservative approach and mark it off-line. Fourth, if the number of drives present prior to scanning is greater than one, and if all the drives on the common bus are not responding then all of these disc drives may be in a power-off or power-fail scenario. When these conditions are satisfied, an indicator flag is set to indicate the abnormal condition. Setting this flag prevents the host computer from accessing any drive in SCSI channel, by returning "drive not ready" error status.

Whenever the abnormal condition flag is set no drives on the SCSI channel are killed or place off-line. Finally, once the user recycles or resets the power to the system, the abnormal condition flag is cleared by the firmware power-on reset initialization, and operation proceeds normally without further action. Since the drives were not killed, the RAID controller will follow the normal power up sequence and no corrective reconfiguration is required.

Reconsideration and allowance of the subject patent application including each of the claims 1-2, 10 and 14 is requested. To anticipate under section 102, a prior art reference must disclose all the elements of the claimed invention or their equivalents functioning in essentially the same way. The inquiry as to whether a reference anticipates a claim must focus on what subject matter is encompassed by the claim and what subject matter is described by the reference. As set forth by the court in Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 USPQ 781, 789 (Fed. Cir. 1983), cert. denied, 465 U.S. 1026 (1984), it is only necessary for the claims to "'read on' something disclosed in the reference, i.e., all limitations in the claim are found in the reference, or 'fully met' by it."

Each of the independent claims 1, 10, and 14 distinguish over Berglund et al., U.S. patent 6,233,693.

Independent claim 1 recites a method for implementing intelligent spin-up for a disk drive comprising the steps of: receiving a command; checking for a disk drive start command; responsive to identifying said disk drive start command, checking a no-start flag; responsive to identifying said no-start flag being set, returning an error code

without starting said disk drive; and identifying a predefined dead device fault, setting said no-start flag, and storing said error code.

Berglund et al. discloses a smart DASD spin-up based upon system power capabilities. However, Berglund et al. fail to disclose and provides no suggestion of a no-start flag, as taught and claimed by Applicant. Berglund et al. fail to disclose and provides no suggestion of identifying a predefined dead device fault, setting said no-start flag, and storing said error code, as taught and claimed by Applicant. Deenadhayalan et al. fail to disclose and provides no suggestion of a no-start flag, as taught and claimed by Applicant. Deenadhayalan et al. fail to disclose and provides no suggestion of identifying a predefined dead device fault, setting said no-start flag, and storing said error code, as taught and claimed by Applicant. Deenadhayalan et al. adds nothing to render obvious the subject matter of independent claim 1. Thus, independent claim 1 is patentable.

Independent claims 10 and 14 respectively recite apparatus and a computer program product for implementing intelligent spin-up for a disk drive. Independent claim 10 recites a disk drive controller; said disk drive controller responsive to receiving a disk drive start command, for checking a no-start flag; said disk drive controller responsive to identifying said no-start flag being set, for returning an error code without starting said disk drive; said disk drive controller for starting said disk drive only responsive to said no-start flag not being set, said disk drive controller for monitoring said disk drive to identify a predefined dead disk drive fault; and said disk drive controller responsive to identifying a predefined dead disk drive fault, for setting

said no-start flag, and for storing said error code. The total teachings of Berglund et al. and Deenadhayalan et al. do not disclose, nor provide any suggestion of a disk drive controller as taught and claimed by Applicant in independent claim 10. Neither Berglund et al., nor Deenadhayalan et al. suggest a disk drive controller for monitoring said disk drive to identify a predefined dead disk drive fault; and said disk drive controller responsive to identifying a predefined dead disk drive fault, for setting said no-start flag, and for storing said error code. Thus, claim 10 is patentable.

Independent claim 10 recites a computer program product including a plurality of computer executable instructions stored on a computer readable medium, wherein said instructions, when executed by a disk drive controller in the disk drive, cause the disk drive controller to perform the steps of: receiving a command; checking for a disk drive start command; responsive to identifying said disk drive start command, checking a no-start flag; responsive to identifying said no-start flag being set, returning an error code without starting said disk drive; starting said disk drive only responsive to identifying said no-start flag not being set; monitoring said disk drive to identify a predefined dead disk drive fault; and responsive to identifying a predefined dead disk drive fault, setting said no-start flag, and storing said error code. Neither Berglund et al., nor Deenadhayalan et al. suggest a disk drive controller performing the steps of responsive to identifying said no-start flag being set, returning an error code without starting said disk drive; starting said disk drive only responsive to identifying said no-start flag not being set; monitoring said disk drive to identify a predefined dead disk drive fault; and responsive to identifying a predefined dead disk drive fault, setting said

no-start flag, and storing said error code, as taught by Applicant and claimed in independent claim 14. Thus, independent claim 14 is patentable.

Dependent claims 2-6, and 12 further define the invention of patentable independent claims 1, and 10, and are likewise patentable.

Applicants have reviewed all the art of record, and respectfully submit that the claimed invention is patentable over all the art of record, including the references not relied upon by the Examiner for the rejection of the pending claims.

It is believed that the present application is now in condition for allowance and allowance of each of the pending claims 1-6, 8-10, 12-14 and 16 is respectfully requested. Prompt and favorable reconsideration is respectfully requested.

If the Examiner upon considering this amendment should find that a telephone interview would be helpful in expediting allowance of the present application, the Examiner is respectfully urged to call the applicants' attorney at the number listed below.

Respectfully submitted,

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